General Data

Weyroc

(REGO)

MAN-MADE TIMBER

THE AIRSCREW COMPANY & JICWOOD LTD., WEYBRIDGE, SURREY

CONTENTS

WEYROC *Man-Made* TIMBER

HISTORY AND DEVELOPMENT

Soon after the war, the extreme shortage of timber in all forms in this country led to the birth of an entirely new industry for the manufacture of a board material combining the properties of space-filling materials such as plywood and hardboard, together with some of the strength properties of timber, and having a degree of stability hitherto not experienced in materials of this kind.

The impetus to this development was given by the necessity for the utilisation of waste, and in this respect chipboard is of very great value to any country's economy in that the raw materials for its production can either be industrial wood waste or forest waste such as thinnings and under-developed timber, thus turning into a useful product material which would otherwise result in costly disposal.

Within a year or two of the end of the war, there were more than forty companies in this country manufacturing a chipboard of one kind or another, but intensive research and development was intelligently applied only by a few companies, with the result that by about 1950 there were only two major manufacturing companies left.

The harm done to the name of chipboard by the large number of inferior materials which were offered was, of course, very considerable, and two or three years were required before the established and approved products which were produced enabled the material to be fully accepted in the building, furniture, and other trades.

The Airscrew Company & Jicwood Ltd. have been in the lead for most of the developments which have taken place in the production of chipboard, and today WEYROC enjoys a name second to none in this country.

The reason for this superiority is the care and attention which is given to the production of the board at all stages, and the high degree of production control which is applied, which includes a process as nearly automatic as it is possible to be, with daily tests and checks of all materials used during production, and also of the finished product.

Moreover, this Company has built up a country-wide selling organisation with the object of providing the maximum service to consumers. Thirteen Main Distributors have been appointed, each covering a large area, and each in turn has appointed a large number of bona fide Merchant Stockists totalling more than 600 in all, from whom information, service and supplies can be obtained. All major points of policy regarding the marketing of Weyroc are decided in consultation with these Distributors and their advice sought on all problems connected with sales generally.

When it was realised that chipboard was a material which had a definite place in the economy of the country, the leading companies decided that in order to maintain the standard of the product, it would be desirable to form an Association, and to this end The British Chipboard Manufacturers' Association was inaugurated in 1949, the declared aims of the Association being:—

(1) To establish and promote the use of chipboards.
(2) To present the co-ordinated views and policies of the members of the Association to Government Departments, Public Bodies, Builders, Architects and others.
(3) To establish standard specifications and codes of testing.
(4) To promote general co-operation between manufacturers and users of chipboard.

At the same time, work was immediately begun on a specification and code of testing for the material, and this formed the basis for a new British Standards Specification, the compilation of which began at an early date, and resulted in the publication of the Standard 1811, 1952, entitled "Methods of Tests for Wood Chipboards, Wood Waste Boards and Similar Boards."

Following on this specification, work has been proceeding for some considerable time on the formation of a Standard for the board itself, and publication of this is now expected at an early date.

Thus it is seen that, from small beginnings, a new industry has arisen producing millions of square feet of board per year, with applications in all branches of industry.

TESTS BY OFFICIAL BODIES

Although standards of quality and methods of tests were laid down for chipboard at an early stage by the B.C.M.A., the actual use of the material is frequently governed by the requirements of some particular application, and it is therefore highly desirable that an independent authority should produce a report on a material of this kind in relation to different particular uses.

To cover this situation, various Government establishments such as The Building Research Station; Fire Research Station and Forest Products Research Laboratory, are prepared to undertake specific tests for manufacturers, and to produce a report of their findings, and users in industry frequently ask for such reports.

Accordingly, it has been the policy of The Airscrew Co. & Jicwood Ltd. to have tests carried out at different stages of development of Weyroc Man-Made Timber, and to have available for inspection whenever required, the reports which have been compiled.

ABRASION

Forest Products Research Laboratory—Report FPRL. 48/3/29. *September* 1949

"Abrasion Tests on Weyroc Wood Waste Boards"

This report covers abrasion tests carried out in the Laboratory on Weyroc wood waste boards, primarily with a view to determine their suitability for use as a flooring material. The results of the tests were very encouraging and the report shows that the material is eminently suitable for this type of application.

SPREAD OF FLAME

Fire Research Station—Report F.R.O.S.I. No. 188. *July* 1950

"Special Investigation on Surface Spread of Flame on Building Boards"

These tests were carried out in accordance with the particulars specified in BSS. 476, 1932, Amendment No. 2, 1945, and the results of the tests show that

the Plain Weyroc board compares very favourably with the most fire resistant timbers, and accordingly the material is normally approved by all local Authorities for building work.

In view of the very great interest in this property of Weyroc boards, the full text of the report is given:—

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH AND FIRE OFFICES' COMMITTEE JOINT FIRE RESEARCH ORGANISATION.

SURFACE SPREAD OF FLAME ON BUILDING BOARDS

Report of Special Investigation for the British Chipboard Manufacturers' Association. 2, *Howard St., London, W.C.2.*

Date of Application for Test

B.C.M.A. letter ref. AGM/MJ dated 12th April, 1950.

Purpose of Test

To classify the material according to its surface spread of flame as shown by tests specified in British Standard Definition No. 476—1932 (Amendment No. 2, 1945).

Spread of Flame Test

The test consists in placing a specimen (size 36″ × 9″) with the face vertical and the long axis horizontal and at right angles to the face of a furnace, which is used as a source of radiation. The board is exposed to radiant heat of an intensity such that gold discs blackened on the side nearest the radiator and polished on the further side, when placed in the same position as the board, would attain temperatures varying from 500°C. at the end nearest the radiator, to 130°C. at the remote end.

The specimen is brought from room temperature into its position of exposure to the full intensity of radiant heat, taking not more than 5 seconds over this operation, and immediately a vertical luminous gas flame 7″ long issuing from a $\frac{5}{8}$″ dia. orifice, placed not more than $\frac{1}{4}$″ forward from the surface and lower edge of the specimen, is applied to the high temperature end for one minute. Observations of the spread of flame are made from the time the specimen is fully exposed to the radiation.

Materials submitted for Test

Eight 9″ × 36″ specimens of $\frac{1}{4}$″ Weyroc Man-Made Chipboard, manufactured by The Airscrew Co. & Jicwood Ltd. were received, and six of them were tested. This board was stated to be composed of wood chips or cuttings, suitably screened and conditioned for moisture content, and bonded with urea formaldehyde under heat and pressure.

Results of Test

The following table shows the distance of spread of flame after 1½ minutes and the final distance and time of spread of flame, both for the six individual specimens tested and for the mean of the six.

F.1025/7/27.
July 1950.
Checked by P.N.

(*signed*) S. H. CLARKE,
Director.

Specimen	Distance of spread of flame at 1½ minutes	Final distance of spread of flame	Time of spread
	In.	In.	min. sec.
1	9¾	29½	15 30
2	10½	33	15 15
3	9½	33½	24 10
4	13½	30½	10 0
5	12¾	33	11 30
6	9	29½	14 45
Average	10¾	31½	15 12

Building materials used as linings for walls and ceilings are classified hy BS. 476—1932, into one of the following groups according to their behaviour in the test.

Class 1. *Surface of very low flame spread.* Those surfaces on which not more than 6″ mean spread occurs.

Class 2. *Surfaces of low flame spread.* Those surfaces on which during the first 1½ minutes of test the mean spread of flame is not more than 15″ and the final spread does not exceed 18″.

Class 3. *Surfaces of medium flame spread.* Those surfaces on which during the first 1½ minutes of test the mean spread of flame is not more than 15″ and during the first 10 minutes is not more than 33″.

Class 4. *Surfaces of rapid flame spread.* Those surfaces on which during the first 1½ minutes of test the mean spread of flame is more than 15″ or during the first 10 minutes is more than 33″.

Conclusions

The tested samples of ¾″ Weyroc Man-Made Chiphoard are classified in Class 3 since the mean spread of flame during the first 1½ minutes of the test was not greater than 15″ and that during the first 10 minutes was greater than 18″, hut not greater than 33″

F. 1025/7/27.
July 1950.
Checked hy P.N.

(*signed*) S. H. CLARKE,
Director.

WEYROC TILES FOR FLOORING

Building Research Station Report No. RSI. 1578. *July* 1951.

"Special Investigation on Weyroc Flooring Tiles"

This test was carried out by the B.R.S. to determine the suitability of Weyroc as a material for the manufacture of flooring tiles, taking into account the protection afforded by normal commercial finishing treatments, and examining it under the conditions of normal use.

In contrast to the earlier test which was concerned more with the Laboratory aspect of the life of the board, this test consisted of the examination of a flooring panel constructed on a concrete slab in the normal way, using a mastic for fixing the tiles to the concrete and finishing the surface of the tiles with a normal recommended treatment.

This unit was then inserted in the corridor of a busy building at the B.R.S. and observations carried out over a period of six months, and results were obtained which indicate that the material has very satisfactory properties for this type of use.

WEYROC BOARDS FOR SUSPENDED FLOORING

The potential field for the application of Weyroc as a material for suspended flooring is so great, and the application is of such considerable interest to the builder, that this report, which was carried out by the B.R.S. and which indicates that the material is quite satisfactory for use in this manner in houses and offices, is reproduced in full.

Building Research Station Report No. RSI. 1615.

"Special Investigation on the behaviour of ¾" Plain Weyroc Board under Static and Impact Loading"

SUMMARY

Vertical static and impact loading tests have been made on ¾" Weyroc resin bonded wood waste board when nailed over timber joists at 16" centres.
Uniformly distributed loads up to 100 lbs. p.s.f. have been applied to the board, without causing damage, and at this load the deflection of the board relative to the joists did not exceed 1/50 inch.
Under standard impact loadings used for testing house floors, damage was slight, and providing that the board is supported and nailed at all edges, it can be regarded as satisfactory for houses and probably also for offices.

Introduction

At the request of the manufacturers, The Airscrew Co. & Jicwood Ltd. of Weybridge, Surrey, loading tests have been made on ¾" thick Weyroc plain board, to determine its behaviour when used as a floor on simply supported timber joists spaced at 16" centres.

The material is made by bonding wood waste with a synthetic resin under heat and pressure, to form boards of a standard size 8' × 4' and having a density of 48 to 59 lbs. per cu. ft.

Various widths of boards ranging from 6″ to 48″ were specially cut, and laid together to form an area of flooring 13′ 4″ × 6′ 0″. Observations and measurements were taken to determine the behaviour of the board under the following loadings.

1. *Uniformly distributed loading*

Superimposed loads of 30, 40 and 50 lbs. per sq. ft. corresponding to Loading Classes I, II and III of British Standard Code of Practice Chapter V—Loading, and 1½ times and twice these loads up to a maximum of 100 lbs. per sq. ft.

2. *Impact Loads*

(*a*) A 56-lb. sandbag dropped from a height of 4′ 0″.
(*b*) A 10-lb. weight dropped from a height of 4′ 0″ on to an area of 1 sq. in.
(*c*) A 100-lb. weight dropped from a height of 6″ on to an area of 1 sq. in.

Erection of Test Panel

Six boards ¾″ thick were supplied in sizes 8′ × 4′; 8′ × 2′; 6″, 12″, 18″ and 36″ × 5′ 4″, together with 11/6″ × 2″ timber joists 7′ 0″ long. These materials were assembled by the sponsors to form a floor area 13′ 4″ × 6′ 0″.

Transverse joints were supported by 2″ wide bearers nailed to the 6″ × 2″ joists, and except in a few cases the free edges were likewise supported.

The type and spacing of nails for fixing the boards to the joists was left to the sponsors, who decided upon 2½″ cut nails skew driven at about 12″ centres along all joists, with additional nails in the centres of the transverse bearers. The edge distance at the top surface of the board was generally 1″.

For the uniform loading test, the floor panel was inverted and the ends of the timber joists clamped to a steel frame in which an air bag was incorporated for application of uniform pressure. The air bag was contained by a decking of 9″ × 3″ timbers supported within the frame, and the sides were closed by further boarding.

For the Impact tests, the floor panel was set up as a normal floor, with the ends of the joists supported by the steel frame.

Method of Test

1. *Uniform Loading*

Air pressure was provided by a small compressor and measured by a water manometer. 1/1000″ dial gauges were used for measuring the deflections of the boards and joists.

An initial upward load equivalent to twice the self weight of the board was applied to the inverted floor, in order to reproduce the normal conditions obtained under self weight when the board is uppermost. This position of the floor panel was taken as the datum for zero live load.

Load was then applied, generally in increments of 15 lbs. per sq. ft. until a maximum of 100 lbs. per sq. ft. had been reached, when it was removed and the recovery noted.

2. *Impact Loads*

Standard apparatus used for testing house floors was employed for these tests.

The order of application followed a random sequence. Observations were then made of any damage or indentations in both sides of the board.

Results of Tests

1. *Uniform Loading*

Application of the live load was terminated at 100 lbs. per sq. ft. without any visible signs of failure after this load had been held for 10 minutes.

The maximum deflection of the board relative to the joists was reasonable. The value of the deflection at different positions are shown in the table for various loads. The immediate recovery on unloading was not less than 90% of the maximum recorded deflection in all cases.

2. *Impact Loads*

A summary of the results of these tests and an indication of the type of crack observed at the points of impact.

(*a*) A 10-lb. weight dropped from 4′ on to 1 sq. in. caused no visible damage to the boards when applied at four points remote from each other, and in two further positions fine cracks not exceeding 4″ in length were produced in the underside of the board. The top surface was practically unmarked.

When the point of impact was 6″ from an unsupported edge of a 4′ wide board, the extent of the crack was, as expected, greater than in previous tests. The top surface, however, still appeared to be uncracked.

(*b*) A 100-lb. weight dropped from 6″ on to 1 sq. in. produced cracks varying from 3″ to 12″ long in the underside of the board at all positions except one, but no damage was observed in the top surface.

(*c*) A 56-lb. sandbag dropped from 4′ on to boards of widths 24″, 36″ and 48″, with supported edges, produced fine cracks 10″ to 16″ long in the underside only. At five other positions, no visible damage was caused to 6″, 12″, 18″, 24″ and 48″ boards with all edges supported.

A slight permanent set (1/32″ hollow) occurred in the boards between joists at most points where tests were made, but in no cases was any cracking seen in the top surface.

The sandbag was finally dropped at a point 6″ from the unsupported edge of a 48″ board, which—as might be expected in a severe test of this kind—punched out an area of approximately 13″ × 18″ between joists.

Discussion of Results

A superimposed load of 100 lbs. per sq. ft. which is twice the Class III Design Loading required by Chapter V of the Code of Functional Requirements of Buildings for rooms used as offices, was satisfactorily carried out by the test panel.

The same panel was used for the impact tests, and in those cases where the edges of the board were supported, the majority of impacts caused only fine local cracking in the underside; there were several instances where no visible damage could be detected. When the test was applied to a board having an unsupported edge, the cracking was more extensive, but in no case did it appear on the top side of the board.

The impact loadings used in these tests are the standard impacts recommended in the National Building Studies, Special Report No. 1 "Structural Requirements for Houses" for testing the adequacy of new types of house floors. They represent actual impacts likely to occur in houses, and are probably applicable to offices.

Conclusions

The behaviour of the test panel indicates that the ¾" Weyroc Plain board can be regarded as satisfactory for floors in houses and probably also for offices.

No damage was observed when the board was tested over timber joists at 16" centres, and subjected to an applied load of 100 lbs. per sq. ft. and at this load the maximum deflection of the board relative to the joists was 1/50 inch.

Providing that all edges of the board are supported and nailed, only slight damage is caused by the standard impact loads used for testing house floors.

Deflection of ¾" Weyroc Board under Applied Uniform Load

Design Live Load W lb./sq. ft.	Applied Live Load lb./sq. ft.	Maximum Deflection Relative to joists in ins. at Gauge 23
30	30 = 1W	.008
30	45 = 1½W	.010
30	60 = 2W	.012
50	75 = 1½W	.016
50	100 = 2W	.020

Building Research Station Report No. RSI. 1691. *July* 1953.

"Report of Special Investigation on a sample of Weyroc Board"

This report deals with a complete set of tests on the physical properties of ½" Weyroc board, and includes full details of the tests carried out with the results obtained.

It is particularly interesting to note that in this series of tests the 'spread of flame' test was repeated both on the Plain board and on the board treated with two coats of oil-bound distemper, and after this treatment the board was classified in Class II, as compared with Class III for the Plain Weyroc.

Tests and observations were made to assess the following properties, and full information regarding any part of this report can be obtained on application to the Company:—

(1) Flexural strength (transverse).
(2) Deflection and effective modulus of elasticity.
(3) Deflection under sustained loads.
(4) Thickness, weight and density.
(5) Water absorption.
(6) Resistance to impact.
(7) Moisture expansion and drying shrinkage.
(8) Spread of flame.
(9) Nailing and working qualities.
(10) Resistance to fungal decay.
(11) Ease of decoration.
(12) Suitability for plastering.
(13) Thermal conductivity.

Building Research Station Report No. RSI. 1692. *July* 1953.

"Report on a Sample of Weyroc Paper Surface Grade"

This investigation was concerned with the suitability for painting of this grade of Weyroc, and also on its resistance to flame spread.

In general the report indicates that painting can be carried out satisfactorily on this grade without additional filling, and also that the addition of the paper surfacing puts the board into Class II for fire resistance, like the distempered board, as compared with Class III for the Plain Board.

SPECIFICATION

Pending the issue of the British Standards Specification which is being prepared. covering the quality of chipboards, Weyroc is manufactured to a specification approved by the British Chipboard Manufacturers' Association, and the principal properties of the material in which users are normally interested are given below:—

Moisture Content. The board has a moisture content between the limits of 10% and 16%.

Thermal Insulation. The conductivity figure "K" is equal to 1.0 B.Th.U. per sq. ft. per hour, per 1" thickness per 1°F., which is similar to ordinary timber.

Fire Resistance. The resistance of Plain Weyroc to flame spread and combustion is equivalent to that of natural structural timber. It is classed in Group III by Fire Research Station Test.

Mechanical Properties. Weyroc is a manufactured material using natural products, and therefore retains some of their inherent variability. During manufacture quality control is employed to ensure a high standard of strength, and, by the application of statistical methods to a very large number of test results. it is possible to quote strength figures which substantially represent the overall quality of the production. The principle of this method of evaluation has been accepted by all leading industries and also the British Standards Institution. All Weyroc testing in the factory is carried out in accordance with BSS. 1811 Methods of Test for Wood Chipboards, Wood Waste boards, and similar boards.

Dimensions and Manufacturing Tolerances.

(*a*) The Boards are manufactured to thicknesses of $\frac{1}{2}$" and $\frac{3}{4}$" plus or minus $\frac{1}{32}$" in each instance, at the specified moisture content.

(*b*) The boards are manufactured to a size of 8'×4' with a tolerance of $\pm\frac{1}{16}$". and on the diagonal dimension, $\pm\frac{1}{8}$", at the specified moisture content.

Moisture Absorption. Plain Weyroc boards of normal density absorb up to 60% by weight after total immersion in water for a period of 24 hours.

Weyroc is normally intended for internal use, and, when used externally, adequate protection must be given to prevent the entry of moisture. See p. 31.

Table of Average Physical Properties of Weyroc.

TEST	GRADE			
	ALL	OTHER GRADES		V.S.
		½″	¾″	
Density, lb./cu. ft.	45			
Modulus of Rupture, normal and parallel to grain, lb./sq. in.		2200	2200	4000
Young's Modulus of Elasticity in compression, lb./sq. in.				
Normal to grain ..	40×10^3			
Parallel to grain ..	130×10^3			
Compression strength lb./sq. in.	2500			
Tensile strength, lb./sq. in.		1000	1000	1350
Impact, 10 lb. wt. on 12″ × 12″ panel		15″	24″	

Guarantee. All Weyroc boards are sold subject to the following guarantee:—

In the event of any defect being disclosed in the goods, the subject matter of this contract, or any part or parts thereof and if the goods, or part of parts alleged to be defective are returned, carriage paid, to us at our works within twenty-eight days of despatch or installation by us, we undertake to examine the same and should we find on any such examination any fault which we acknowledge to be due to defective materials or workmanship, then we will repair the defective goods or part or parts thereof, or at our option supply new goods or parts in place thereof. The purchaser must be responsible for the cost of delivery to and collection from our works of all goods, whether repaired, replaced, or merely submitted for examination, and we are to be under no liability for any such goods not collected within fourteen days of notification by us to arrange collection.

In view of the foregoing guarantee (1) we are not to be responsible for any personal injuries or consequential liability or damage arising from or out of the supply whether originally or by way of repair or replacement by us of any goods, and (2) any other warranty, condition or liability of any sort whatsoever, whether implied by common law, statute or otherwise, is hereby expressly excluded.

Weyroc is sold on the terms set out in the specification leaflet and on our general terms and conditions of sale only, and any other terms, any prior representations or warranties by anyone on our behalf are hereby expressly excluded.

GRADES AND USES

Weyroc is manufactured in different grades, each of which is suitable for particular applications.

(*a*) **Plain Weyroc.** This board has the natural colour of wood chips with the shade variation inherent in wood, which in many cases provides an interesting appearance. The surface is comparatively smooth, and in this form the boards are used in many building applications particularly when not required for decorative purposes, although for certain work the mottled appearance of the wood chip can be quite attractive. When filled according to normal practice a perfectly smooth surface for painting can readily be obtained. (See Table 6).

(*b*) **Paper Surfaced Weyroc.** This grade consists of the Plain board with a paper bonded to it with a synthetic resin glue which, in addition to giving somewhat greater protection against moisture, also provides a filling which forms a good base for subsequent decorative treatment such as painting, and reduces the preparation labour in filling required when using the plain board. This grade is particularly suitable for work such as built-in furniture, which is destined ultimately to have a paint finish.

(*c*) **Veneered Surfaced Weyroc.** Decorative surface veneers are applied to Weyroc during manufacture, giving a perfect bond between the Weyroc and the veneer, and forming a material which can be used with complete success for the manufacture of all grades of highly decorative work such as furniture and panelling. All the normal finishing treatments which can be applied to timber are suitable.

(*d*) **Plastic Surfaced Weyroc.** A clear plastic surface finish can be applied to the board, which is suitable for giving some protection against accidental contact with water, such as in flooring applications to protect the board against the type of treatment it receives during building, and for roofing applications to protect the board during the period between erection and covering with the final roofing material. The finish is not intended to be a complete waterproofing, but does give a good degree of temporary protection. It also provides a satisfactory surface for subsequent paint treatment, and avoids some of the rubbing down between coats which may be found necessary with the Paper Surfaced grade. The principal applications for this material are in $\frac{3}{4}''$ thickness for suspended flooring.

DESIGN FEATURES OF WEYROC

In designing with Weyroc, two features play very important roles. These are the large sizes in which the boards can be obtained, and the freedom from variability of physical properties. These properties are built into the board during manufacture by advanced process control, and as a result the material is, to all intents and purposes, isotropic. This property, together with the large size of the boards, ensures that the designer can always use his material to the maximum advantage with the minimum waste. Moreover, on account of this large board size, many applications become possible which are obviously either impossible or difficult, and necessitate much extra labour, when using timber in the limited sizes in which it can be obtained.

For instance, panelling can be carried out, full-size 8′ × 4′ veneered sheets giving an ease of construction and finished appearance hitherto unobtainable.

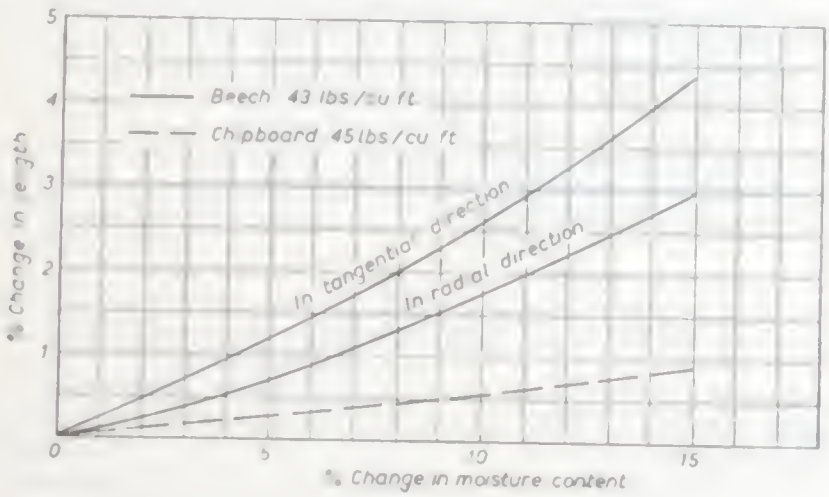
It is important to note that applications such as this, relying on the large sizes of Weyroc, only become possible on account of another property of the material.

Weyroc on account of its substantially isotropic nature, which in turn is, to a large extent, brought about by the random distribution of the grain direction in its structure, contracts or expands similar amounts along both axes. Moreover, the movement which is experienced is small, about 0·06% per 1% change in moisture content, and so there is little likelihood of either warping or bowing. In addition, for most applications of this kind, and for reasonable changes in the moisture content of the air, the dimensional change in any direction can usually be ignored.

From a study of the different behaviour of timber and Weyroc with change in moisture content, as indicated in the graph, Fig. 1, it is clear that provided due attention is given to design very substantial advantages can be obtained by its use.

One important point to note, however, is the effect of the large size of the board on its behaviour under conditions of changing moisture content. For example, an 8′ length measured in timber might consist of, say, 16 6″ wide boards, and the total gap produced by contraction due to moisture content change would be spread out between the 16 boards. In the case of the Weyroc board, however, although the contraction might be as little as 1/10th the contraction for timber, it would be concentrated into one gap. Under certain adverse conditions this could possibly be as much as ¼″, but normally it should not be much more than ⅛″. This point must be carefully noted when designing with full-size sheets. (See also pages 20-35).

FIG. 1



Moisture Content Graph.

Balanced Construction. In designing combined timber and Weyroc structures, due allowance must, of course, be made for the different contractions of the two materials. For instance, a large area of plywood is often successfully stiffened by the application of a light timber framing to one side only. While a perfectly satisfactory procedure in this case, if a similar method were adopted with chipboard, bowing or warping would be almost inevitable due to the different way in which the materials would react to changing moisture content. When using this method with chipboard, therefore, greater strength is required in the framing. Countless examples of a similar nature could be described, but provided the design is such that the construction and treatment is always "balanced", no difficulty will be experienced.

Other typical cases in which the importance of balanced construction should be stressed are:—

(*a*) **Painting**—whenever a Weyroc board is painted, unless it is firmly secured in position, whether it is Plain or Paper Surfaced, similar paint treatments should be given to both sides, as otherwise bowing is likely to take place due to contraction of the paint film.

(*b*) **Veneering**—when Weyroc is veneered, either with wood or with laminated plastic veneers, it is essential that a backing veneer be used, stiff enough to withstand any pull imposed by the face veneer. For normal wood veneering, it is sufficient to apply a backing veneer of equivalent thickness to the face veneer; but when using any other material such as laminated plastic, the backing veneer should be appropriately stronger.

(*c*) **Wall Panelling**—it is essential when panelling any wall in which there is any risk of the atmospheric conditions being different on the two sides of the board, to ensure that the supporting structure in itself is sufficiently robust to prevent bowing of the board. If one side of the board can pick up more moisture than the other from the air, then this side will expand more and bowing will almost inevitably result.

(*d*) **Framing**—when framing Weyroc panels, it is necessary to allow expansion distance round all edges to guard against differential dimensional change due to change in moisture content.

MACHINING

In general, most normal methods of machining timber are applicable to the processing of Weyroc, but there are a few points of difference which are worthy of particular notice.

Due to the resin content of Weyroc the effect on tool edges is somewhat greater than with softwoods, but provided that care is given to tool sharpening, no undue difficulty should be met.

For machining in large quantities it is advisable to use tungsten carbide tipped tools as much longer runs are then possible between successive sharpening.

Sawing

Weyroc can be cut equally well on straight line edging and cross-cut saws and the Table shows suitable particulars.

	Straight Line Edging	*Cross-Cut*
Spindle Speed	3,000—3,500 r.p.m.	3,000—3,500 r.p.m.
Peripheral speed	10,000—12,000 f.p.m.	10,000—12,000 f.p.m.
Feed Speed	50 f.p.m.	Hand feed
Diameter	14″	14″
Teeth per inch	30—34	40
Angle	12° 30′	12° 30′
Gauge	10–11 s.w.g.	10–11 s.w.g.

(1) It is advisable to use a Riving knife to avoid pinching at the back of the saw.

(2) When any quantity of Weyroc is to be cut, tungsten carbide tipped saws are recommended, as intervals between sharpening are less frequent than with high speed steel saws.

(3) The depth of the saw protruding out of the saw bench should be $\frac{1}{2}$″ greater than the thickness of the material being cut. This avoids side slap and cutting by the back of the saw.

(4) When the material shows a tendency to ride over the saw this is a sign that the saw needs re-sharpening.

(5) Approximate interval between sharpening of saws depends, of course, on the quality of the sharpening, which also greatly affects the quality of the cutting, but may be taken to be:

Carbide tipped saws	15,000 feet
Steel plate saws	3,000 feet

(6) Setting with carbide tipped saws is not normally necessary as this is provided by the shape of the cross section of the teeth, but steel plate saws require setting in the usual way.

(7) When cutting either Paper Surfaced or Veneered material, the face side should be uppermost, and support should be given to the underside as close as possible up to the saw cut.

Band-Sawing

Band-sawing follows normal timber practice and almost any type will provide successful cutting. The shape of the cut to be made controls the width of the saw to be used, the only difference between Weyroc and timber practice being that more frequent sharpening will be required with Weyroc. Radii can be jigged in the normal manner.

Profiling, Routering and Grooving

Here again normal timber practice applies, but it is advisable to use tungsten carbide tipped tools if exceptionally long production runs are likely to be undertaken. Satisfactory work, however, can be carried out with high speed steel cutters. Suitable speed for spindle, 6,000 r.p.m., suitable speed for routering 24,000 r.p.m.

Planing

Edge planing with normal overhand planers is satisfactory, but face planing is neither necessary nor recommended.

Drilling

Weyroc can be drilled in the normal manner, using hand or machine tools.

STRENGTH OF WEYROC

In the Weyroc specification figures are given for strength, which, on the face of it, may appear to compare very unfavourably with timber. It must be remembered, however, that the figures for Weyroc apply substantially to the strength in all directions, whereas in the case of timber the figures normally quoted are for properties along the grain.

In the type of application to which a large sheet material is most suited, it is frequently the case that high tensile strength is not the most important property, but rather that strength shall be the same in all directions, and, with suitable design, the lower values for Weyroc do not constitute any difficulty.

The consideration of strength can be viewed in two ways, namely the maximum loading which can be applied before the material breaks, and the maximum loading which can be applied before an unacceptable degree of bending takes place. In other words, the two properties, strength and stiffness, are both considered in normal applications.

In the graphs, Figs. 2 and 3, are shown the maximum safe loads which can be applied to Weyroc of various spans, widths and thicknesses, these figures not taking into account the fact that a fair degree of bending may take place, but merely that the loads can be safely supported. In compiling these graphs a factor of safety of 2 has been used, but a larger factor may be desirable for particularly severe loading conditions such as those involving impact.

In order to cover a frequent practical application of the material, namely shelving, in which no very great degree of bending can be permitted, it is desirable to have a different criterion, and to base calculations on the stiffness of the material. The figures shown in Tables 1 and 2 give this information for various sizes in common use.

In assessing the strength of Weyroc, it is always necessary to realise that its impact strength is lower than that of timber, and if there is any possibility of any heavy weight being dropped on the material, then special consideration should be given to its suitability.

Weyroc for Load Bearing

FIG. II

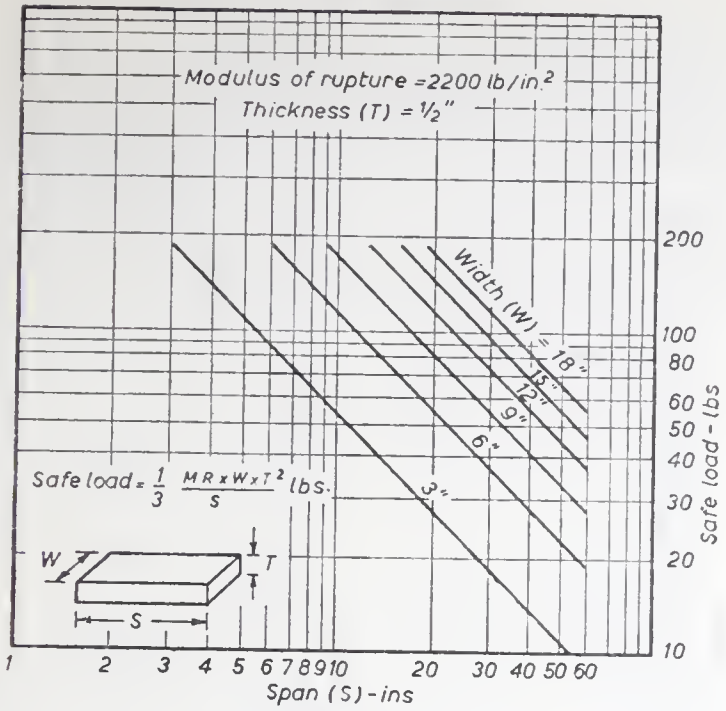
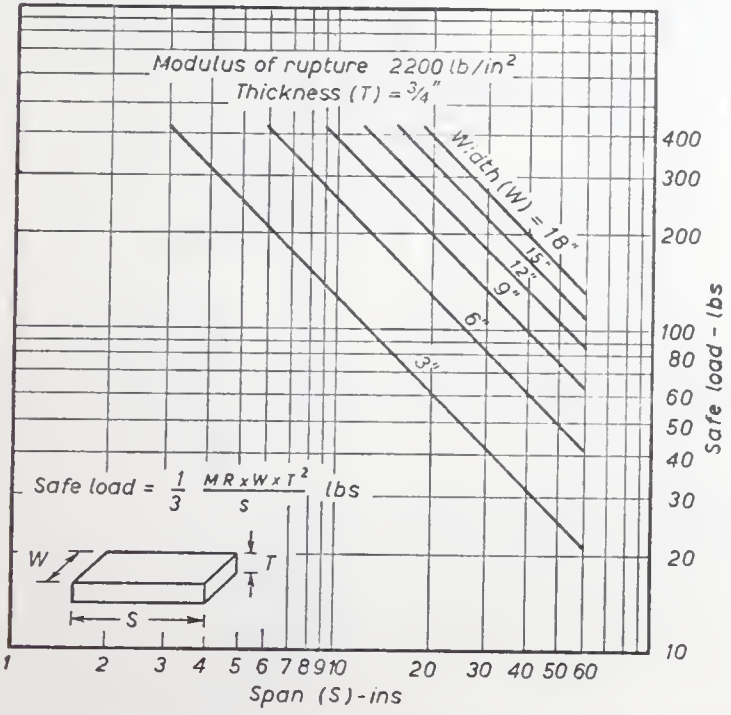


FIG. III



Tables of Recommended Support Centres for Shelf Construction

TABLE 1 — ½" Weyroc

Shelf Width in inches	Maximum distances in inches between supports for the loads shown.*				
	10-lbs.	20-lbs.	30-lbs.	40-lbs.	50-lbs.
3	11	8	6½		
6	16	11	9	8	
9	19	13½	11	10	
12	22½	16	13	11	
15	25	17½	14½	12½	
18	27½	19½	16	13½	12

TABLE 2 — ¾" Weyroc

Shelf Width in inches	Maximum distances in inches between supports for the loads shown.*										
	10-lbs.	20-lbs.	30-lbs.	40-lbs.	50-lbs.	60-lbs.	70-lbs.	80-lbs.	90-lbs.	100-lbs.	110-lbs.	120-lbs.
3	20½	14½	12	10	9	8						
6	29	20	16½	14½	13	11½	11					
9	35	24½	20	18	16	14½	13½	12½				
12	41½	29	24	20	18	16½	15½	14½	13½	13	12	
15	46	32	26½	23	20	18½	17	16	15	14½	13½	13
18	50	36	29	24	22½	20	19	17½	16½	16	15½	14½

* Tables are based on a deflection not greater than 1/360 × span, and distributed load.

Multiply spans by 0.8 for concentrated loads.

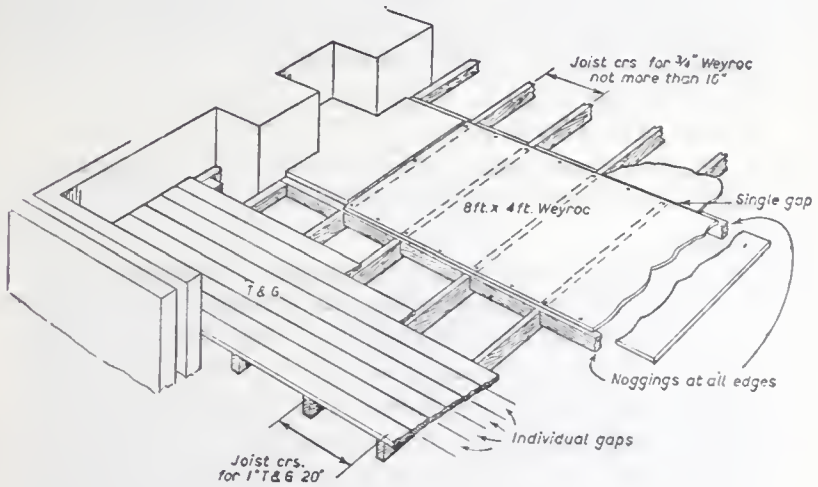
PARTICULAR APPLICATIONS

During the time in which Weyroc has been manufactured and become accepted for a wide variety of building and other applications, various points have arisen in regard to particular uses which it is helpful to have recorded, as in these respects the material behaves somewhat differently from more conventional materials at present in general use.

The applications mentioned are, of course, not intended to be exhaustive in any way, neither is there any expectation that all the queries which arise in the mind of the user with regard to his particular work will have been covered, but the list should prove helpful to those adopting this material for the first time.

Suspended Flooring

FIG. IV



Building Research Station tests (see p. 6) have been carried out on Weyroc for this use, and it has been found to be satisfactory. There are, however, various points which should be made to ensure that a very satisfactory job can be produced:—

(*a*) Wherever possible it is desirable to use the Plastic Surfaced grade, as this affords some measure of protection against moisture, guards against dirt becoming ingrained during building operations, and gives a very attractive finished appearance to the floor.

(*b*) Recommended spacing between joist centres for ¾" material is not more than 16" and nogging pieces must be fitted at all edges.

(*c*) All edges must be securely fixed either by screws or nails, and 12″ centres are suggested as a suitable distance. Cut nails are quite satisfactory.

(*d*) If Weyroc boards are to be fitted to joists laid directly on the ground floor when there is any possibility of damp arising, it is advisable to paint the underside and edges with aluminium bitumen paint or similar. Alternatively a damp proof preparation can be applied to the floor itself, or a damp proof membrane be interposed between the floor and the Weyroc.

(*e*) Wherever possible the boards should be kept for a period under the ultimate conditions in which they will be used, before fixing. This, of course, is frequently impracticable, but will avoid the appearance of gaps between boards under excessively dry conditions.

(*f*) If boards are laid under very damp conditions and subsequently become very dry, contraction will take place, which, under the worst conditions, may result in gaps up to $\frac{3}{16}$″ between boards. This is, of course, a total contraction very considerably less than would be experienced with timber, but is concentrated in one place, and therefore appears large. Filling can be satisfactorily accomplished using "Brummer" Stopping, which can be supplied to tone exactly in colour with the Weyroc.

(*g*) If Plain Weyroc is used for flooring, the boards should be sealed with a good proprietary brand of sealer as soon as possible after laying.

(*h*) Maintenance is most satisfactorily carried out by wax polishing and in no circumstances should the floors be scrubbed.

Solid Flooring

This question is also dealt with under the section of Flooring using Weyroc blocks and tiles, but in certain cases it is required to fix the full-size sheets to a concrete sub-floor, and the following precautions should be observed:—

(*a*) The 8′ × 4′ sheets cannot successfully be fixed using mastic only.

(*b*) Timber battens should be fixed to the floor in the appropriate positions. (Fig. V). Alternatively the battens can be fixed to the sub-floor and the floor then screeded level with their surface. (Fig. VA). The Weyroc sheets can then readily be screwed along all edges. In the latter case for all normal applications, $\frac{1}{2}$″ thick Weyroc is quite satisfactory.

(*c*) If there is any possibility of damp arising, the under sides and edges of the boards should be treated with aluminium bitumen paint. If battens are fixed to the surface, a moisture-proof infilling can be used.

(*d*) Sanding along joints may be necessary if a perfectly continuous surface is required, and the same remarks regarding expansion apply to those under 'suspended flooring'.

(*e*) In cases where very heavy wear may be expected, high density $\frac{5}{8}$″ boards can, with advantage, be used in place of normal density.

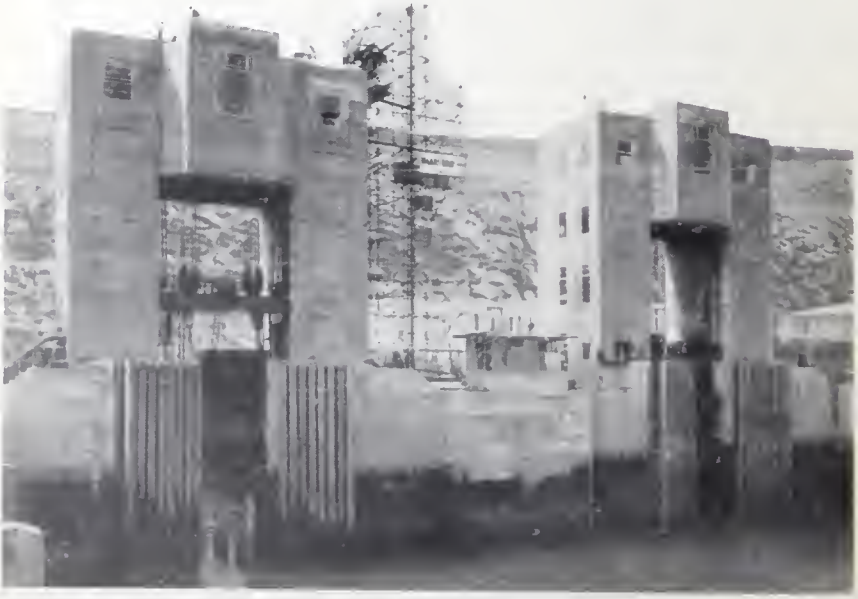
In using Weyroc as flooring for fixing to joists both on first floors and ground floors, it is important to understand fully the behaviour of the material, so that, after the Weyroc has been fixed, there is no cause for complaint regarding small gaps which may appear between sheets.

Oak veneered Weyroc wall panelling

Weyroc tile floor laid in a school hall in the home counties

Plastic-surfaced Weyroc combined with Dexion Angle for parachute packing benches

Courtesy The G.Q Porochute Co. Ltd., Woking



Part of the Dover Car Ferry installation in which Weyroc was used for concrete shuttering

Courtesy Mears Bros. (Contractors) Ltd., London

Dining Room Suite constructed entirely of Weyroc

Courtesy Tailormode Furniture, Worthing

Executive desk of oak veneered Weyroc

Weyroc Demonstration Vehicle

Interior Weyroc Demonstration Vehicle. Fittings entirely of Weyroc— various grades.

FIG. V

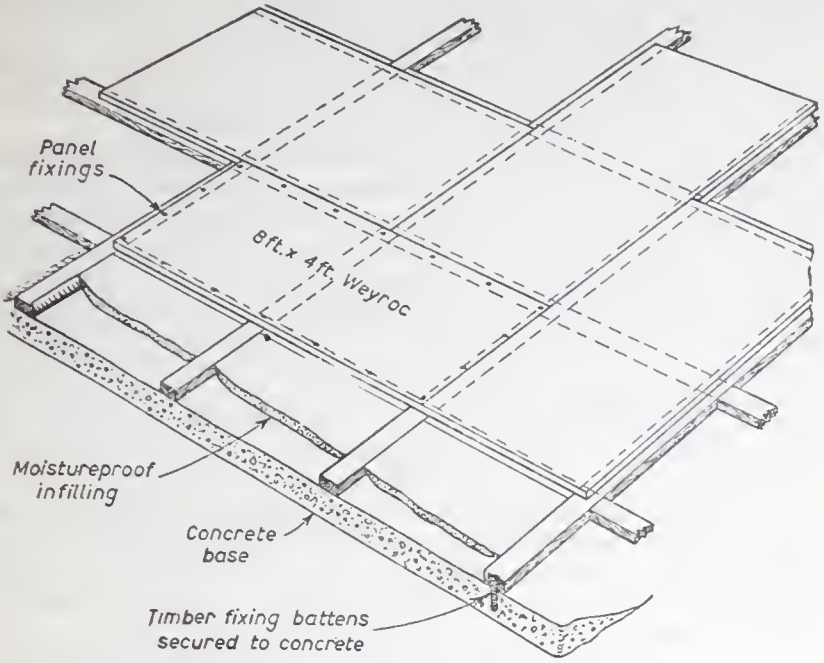
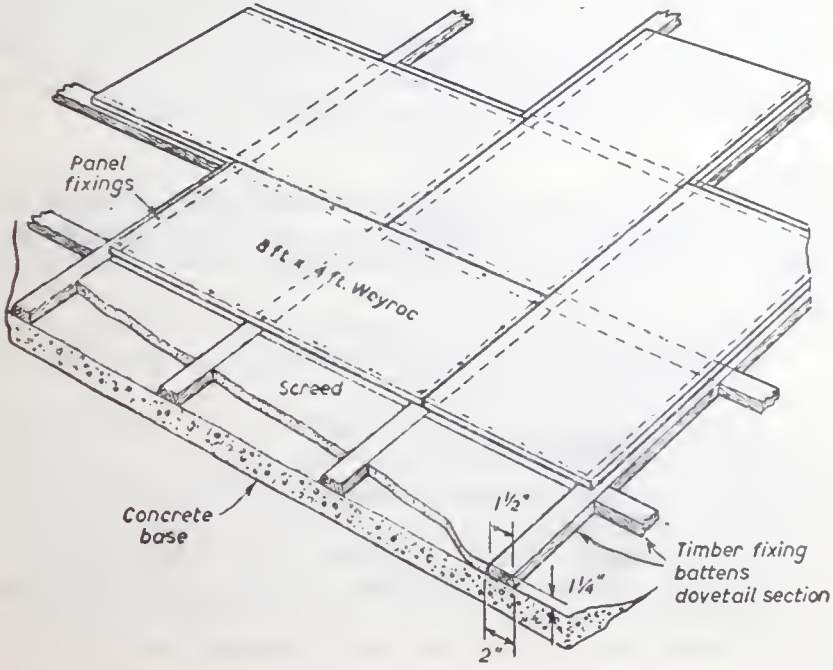

Panel fixings
8ft. x 4ft. Weyroc
Moistureproof infilling
Concrete base
Timber fixing battens secured to concrete

FIG. VA


Panel fixings
8ft. x 4ft. Weyroc
Screed
Concrete base
1½"
1¼"
2"
Timber fixing battens dovetail section

Weyroc is conditioned in the factory to have a moisture content between 10% and 16%, and this moisture content will be obtained when Weyroc is in equilibrium with normal atmospheres in dwelling-houses.

As such a normal atmosphere varies and becomes either much wetter or much drier, Weyroc will accordingly pick up moisture from, or lose moisture to the atmosphere, with an attendant small change in linear dimensions.

This phenomenon is common to all timber products, and dimensional change in the case of Weyroc is, in fact, very considerably less than in the case of timber when measured across the grain. In the former case the contraction is approximately 1 in 300, and in the latter anything up to 1 in 40 for a change corresponding to the variation in moisture content from 12% to completely dry. (See Fig. I).

It will readily be seen from these figures that a section of flooring 8′ long laid with T. and G. boards 5″ wide, could have a total contraction when dried out completely, of anything up to 2½″. In this length there would be 19 boards, and accordingly this contraction spread over the whole length would only represent a gap between boards of about ⅛″. In the case of Weyroc, however, the total contraction would be about ⅓″, but this, of course, would be concentrated in one space instead of being spread over 19 boards. (*See Fig. IV*).

Thus, although Weyroc does in fact move a considerably less amount with changing moisture content than timber, the total movement under the worst possible conditions, could result in gaps of about ¼″ after the sheets have dried out fully, although, of course, in practice gaps greater than ⅛″ to $\frac{3}{16}$″ are unlikely to be experienced.

Under normal conditions if the boards are fitted with close joints, the movement will be very small indeed, but if it so happens that they have been stored in a damp atmosphere either in the warehouse or on the site prior to fixing, their moisture content may be appreciably above that when leaving the factory, and drying out will result in gaps appearing. It is important to understand this point fully when contemplating the use of full-sized sheets, as otherwise a false impression will be obtained of the properties of Weyroc which is, in fact, a material with a very much smaller contraction factor than that of timber across the grain.

Roofing

Weyroc is extensively used as a lining for roofs to replace wood boarding, and effects worthwhile savings in labour. In considering this type of application, attention should be given to various points arising from the nature of the material:—

(*a*) Provide protection from rain for the material on the building site and during the period when the boards are fixed to the roof but have not had the final covering applied.

(*b*) To assist with protection a Plastic Surfaced board is available, the surface delaying the rate of pick-up of moisture by the board.

(*c*) Support and fix the boards at all edges using cut or wire nails or screws, at 12″ pitch.

(*d*) Allow an expansion gap of ¼″ between boards when fixing. This is necessary as very damp conditions can be experienced in roof spaces during building operations. Fig. VI.

(*e*) Use rafter spacings in accordance with the details in Table 3.

(*f*) Use only coverings impervious to moisture, and if the covering should be fixed directly to the boards, provide means of sealing nail or screw holes, as, for example, liberal coatings of waterproof mastic.

(*g*) Provide adequate support for any overhang at the eaves, as otherwise waviness may result.

(*h*) Give very careful protection with paint to every exposed portion of board, and particularly to the edges.

FIG. VI

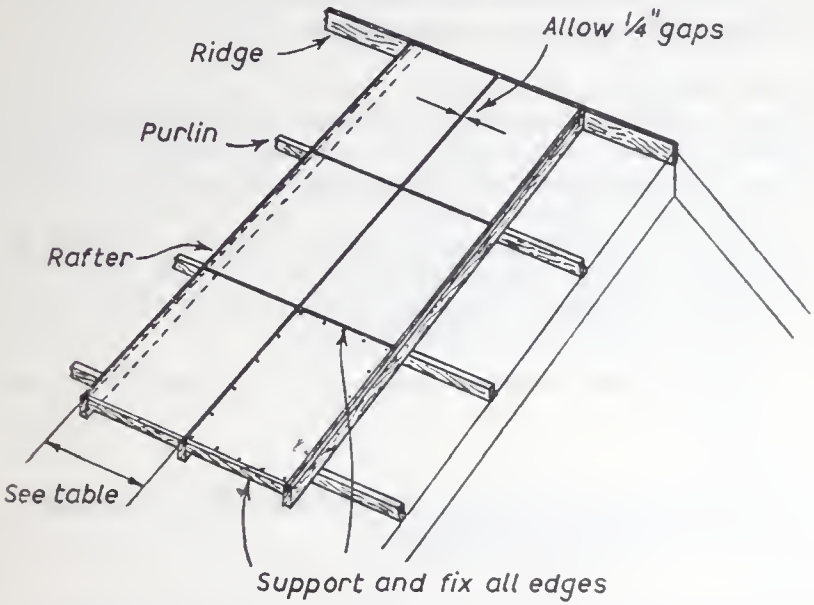


TABLE 3

Recommended Supports for Weyroc used as Sarking on Flat and Pitched (30°) Roofs

Thickness	Distance apart of Supports	
	Flat	Pitched
½″	12″ centres	18″ centres
¾″	24″ centres	36″ centres

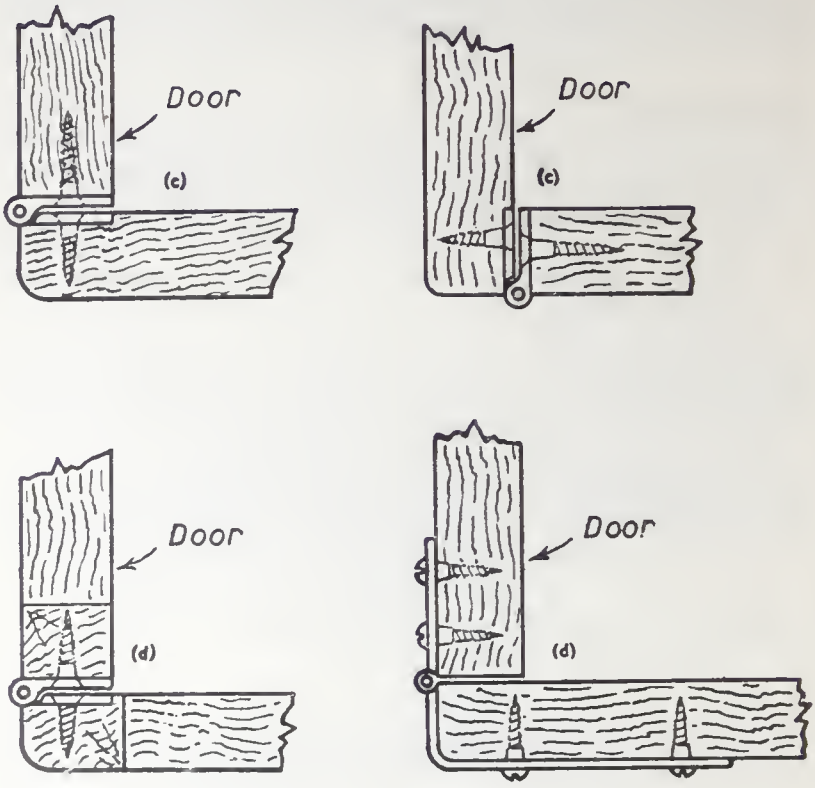
Normal snow loads and support of workmen during erection are considered.

Nogging must be used, and boards must be secured on all edges. Expansion joints ¼″ minimum must be allowed.

Protection for weather until covered must be provided.

Plastic Surfaced boards are recommended, with edges treated with Aluminium Bitumen Paint.

FIG. VIII



Partitioning

On account of the large sheet size, dimensional stability, ease of finishing and availability of attractive wood veneered surfaces, Weyroc is the ideal material.

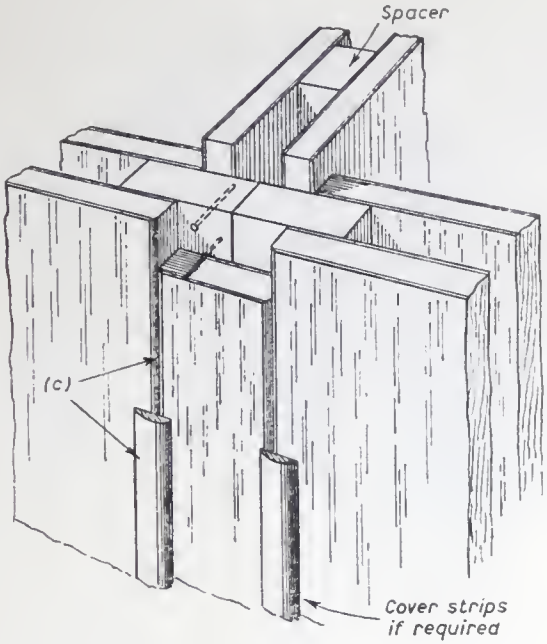
(*a*) Fix to existing walls with Weyroc or timber studding.

(*b*) If damp is suspected, paint reverse side of sheet with aluminium bitumen paint.

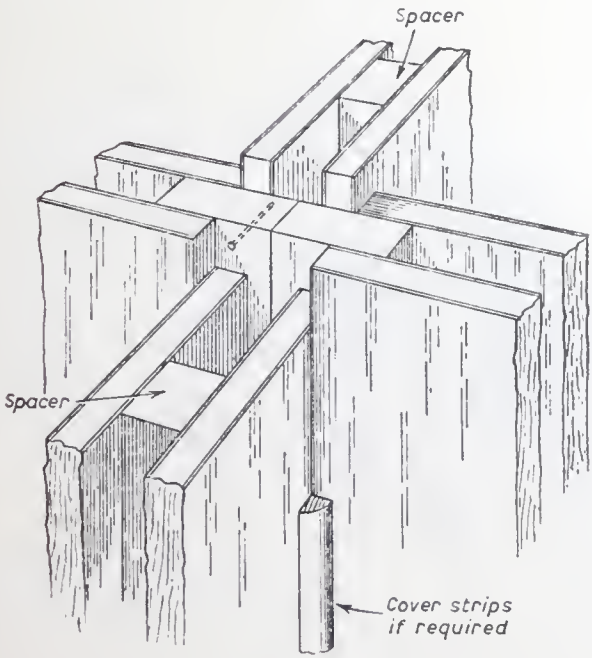
(*c*) Use cover strips or beading over joints or close butt with chamfered edges. (See Fig. IX).

(*d*) For free standing partitions use double skin construction with supports and fixings as indicated in Fig. IX. illustrating a typical form of prefabricated partitioning.

FIG. IX

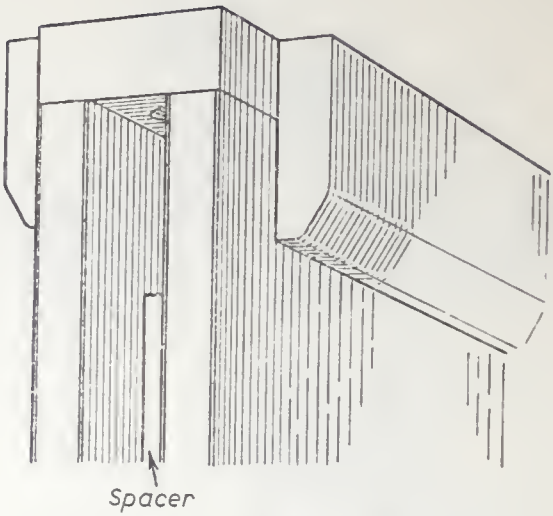


Tee Joint

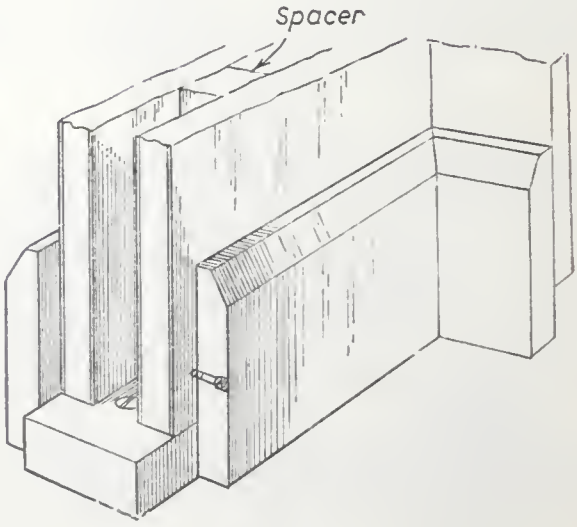


Cross Joint

FIG. IX

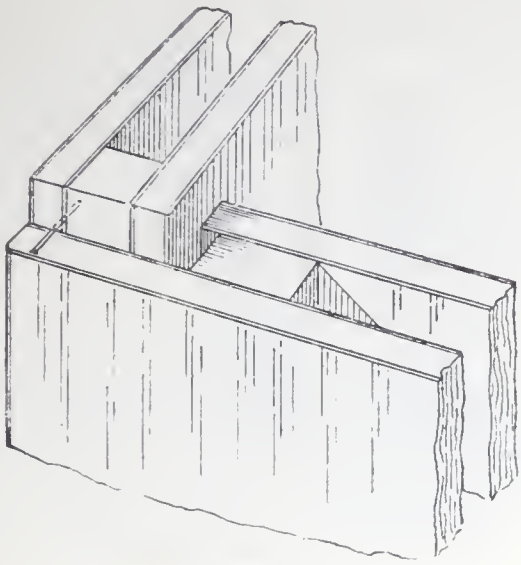


Top of partition to ceiling



Bottom

FIG. IX



Corner

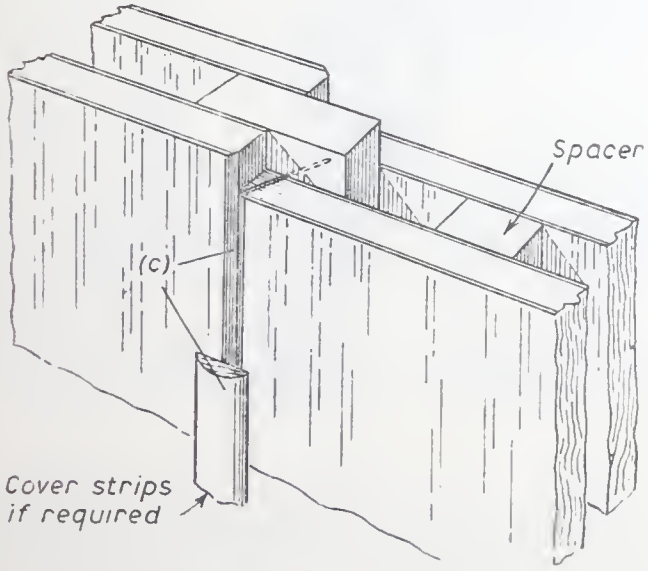
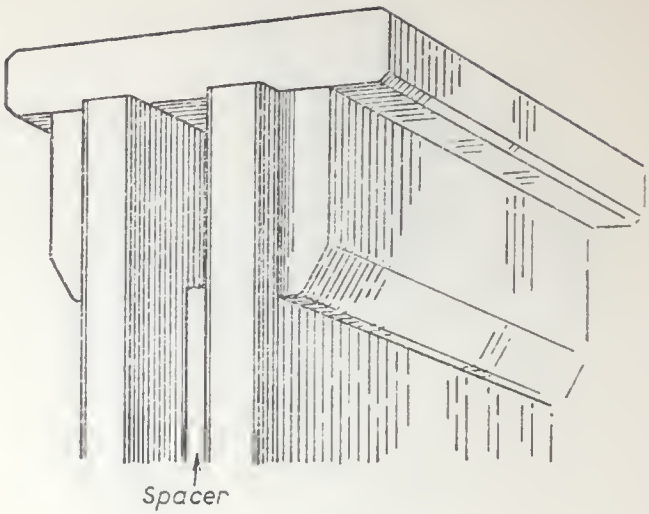
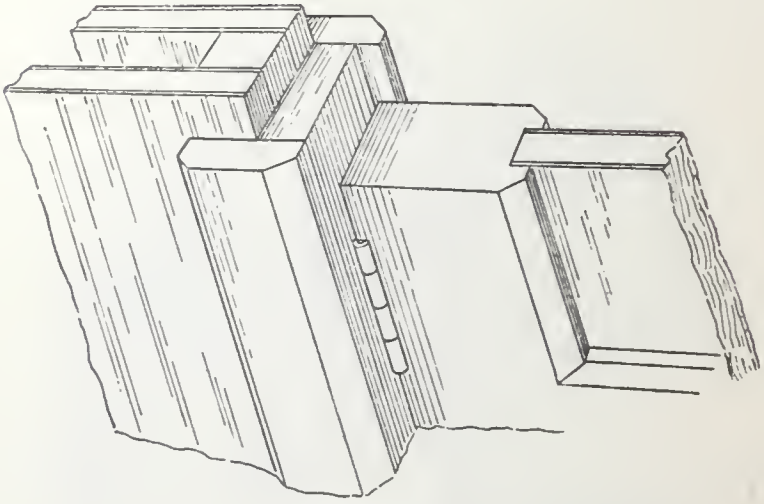


FIG. IX



Top of Free Standing Partition



Door Frame

Outside Uses

Weyroc is primarily intended as a material for inside use. When a chipboard becomes saturated, the chips on the surface become raised and the board loses strength. In time, after repeated saturation, failure can occur, but with careful paint protection, a long life can be obtained.

(*a*) Avoid outside applications in which very smooth paint finishes are required and in which absolute stability of size is essential.

(*b*) Use balanced construction (see p. 14).

(*c*) Seal all edges with red lead or flexible sealer before assembly and all joints afterwards, and protect with three or four coats of good quality paint.

VENEERING

Although Weyroc is available with high quality wood veneers applied during manufacture, there are many applications in which it is necessary for the user to carry out his own veneering, and provided the recommendations given are followed successful results should be obtained. It is particularly important to note that surface finish, type of adhesive and balanced treatment are the three factors to which the most careful attention must be given.

Conditions

(*a*) Weyroc surfaces should not be heavily machined, light sanding by hand or Drum Sander being sufficient to ensure good surface.

(*b*) If heat is used to cure the glue, the temperature must on no account rise above 200° F., cooling to shop temperature before releasing pressure.

(*c*) Heating up and cooling are to be equal on both faces of the boards.

(*d*) Maximum pressure permissible: 150 lbs. per sq. in. evenly distributed.

Adhesives

(*e*) Phenolic adhesives are recommended whether for hot or cold setting, the former to fall within the temperature range stated in (*b*) above.

(*f*) Urea formaldehyde adhesives can be used, bearing in mind that water is present and more careful attention must be paid to complete curing and subsequent storage of finished boards, allowing even moisture distribution throughout.

(*g*) Casein or Animal adhesives are not recommended if Phenolics or Ureas are available; they have a high water content and must be thoroughly understood to be used successfully.

Adhesive Application

(*h*) Adhesive should be applied as a thin, even film; heavy spreading is wasteful. In the case of Urea or Casein excess moisture is introduced.

(*i*) Adhesive should be mixed before use. Separate application of resin and hardener is not recommended.

Veneers

(*j*) Both facing and backing veneers to be equal thickness, say between 0.6 and 0.8 mm.

(*k*) Grain direction and characteristics to be similar.

(*l*) Moisture content to be between 8% and 14%.

(*m*) Open assembly time should be equal, if glue is applied to board and veneer.

Laminated Plastic Veneers

Weyroc forms a very satisfactory material as core stock for surfacing with the laminated plastic veneers which are now being extensively used for working surfaces in kitchens and similar applications. Very satisfactory results can be obtained, but it is important to observe certain precautions when carrying out this work in order to secure a satisfactory bond and freedom from later movement.

It is difficult to be precise about the nature of the backing material which must be used, as much depends on the rigidity of the structure to which the finished board is to be fixed, but as a general practice it is highly desirable to use a backing material of a similar nature to the surface veneer.

Procedure

(1) Sand both surfaces of the Weyroc boards to remove any raised chips or any greasiness of surface which may have resulted from handling, and also to secure a perfectly flat surface.

(2) Apply the resin hardener to the under face of the plastic sheet, which has the effect of cleaning and neutralising any alkali which may be present.

(3) If balancing is being carried out with a plastic sheet, the same preparatory treatment should be given, or if with wood veneers, it should be seen that these are clean and free from any grease.

(4) Whenever possible use a cold setting phenolic resin glue such as Cellobond 266/4 (British Resin Products). The reason for this preference is that the plastic sheets are relatively non-absorbent, and if glues with a high moisture content are used, then the total absorption has to be taken up by the Weyroc core, with the risk of ensuing difficulties. The phenolic resin glues have a very low moisture content.

(5) Whenever possible use cold pressing with a pressure of not less than 50 lbs. per sq. in., the pressing cycle being dependent on the particular glue used. If hot pressing is to be used, then the glue manufacturers' instructions should be carefully followed. Never use hot pressing if metal or alloy skins are to be fixed to the reverse side of the board. When hot pressing is used always cool the press before releasing the pressure.

(6) Both before and after pressing, the decorative surface of the plastic laminate should be cleaned with hot water only, and the utmost precaution should be taken to see that there is no dust or other solid matter on the face of the board.

General

Use Phenolic Cold Setting adhesive to ensure warp-free boards for immediate use. When Hot Setting adhesives are used, boards should be put "in stick", giving at least ½" air gap with sticks in line, remaining for 48 hours or longer if possible.

SURFACE FINISHING

In producing high quality finishes, much depends on the skill and experience of the craftsman carrying out the work, and it is difficult to give comprehensive information to cover all the desired finishes. An attempt is made in Table 4 to summarise surface treatment information in a concise way, together with notes on the methods which should be adopted.

When proprietary materials are being used, the makers' instructions should be closely followed, and when the work is carefully carried out, very satisfactory results can be obtained economically, thus ensuring that the maximum advantage is taken of the size and stability properties of Weyroc.

TABLE 4

Surface Treatments

Finish	Materials Used	Grade of Weyroc normally applied to	Method	Typical Uses
Clear	—	Plastic Surfaced	—	Built-in furniture, flooring on joists, shuttering
Clear	Hard Varnish	Plain	Apply direct or 1	Built-in furniture
Clear	French Polish	Plain Veneered	2	Furniture, etc. High quality furniture, shop-fitting, panelling, etc.
	Bourne Seal (*) Phenopol (*)	Floor Tiles Floor Tiles	3 3a	Flooring Flooring
Stain	Spirit Stain All stains	Plain Veneered	4 As for wood	Furniture, Flooring Furniture
Distemper	Plain or oil-bound distemper	Plain Paper Surfaced	Apply direct Size and apply	Stand fittings, Wall linings, etc. As above for smooth surface
Paint	Oil, Cellulose, or Emulsion	Plain Paper Surfaced Veneered	5 5a Treat as wood	Built-in furniture and many other building applications
Plaster	Commercial plasters	Plain	6	Wall linings

* See p. 38.

Methods

1. Moisten surface with water and when dry sand smooth. Fill with Albastine or similar filler, mixed in accordance with instructions, and when dry sand smooth again. Apply the desired number of coats of a good quality hard varnish or varnish stain.

2. Proceed as in (1) to the second sanding and then French polish in the usual way.
3. Remove any dirty patches by lightly rubbing with steel wool or a stiff brush dipped in white spirit. Brush off all loose dust. Apply sealer liberally in accordance with instructions. Allow to dry and apply second coat. Repeat with third coat if required. When quite dry, wax polish with good quality hard wax paste.

3a. Proceed as above, but do not wax polish. Particular care must be taken to follow makers' instructions relative to proportions for mixing finish and hardener, and with regard to application times.

4. Remove dirt as in (3). Apply one coat of sealer, e.g. button polish. Apply spirit stain such as "Colron" with rag or brush. Care should be taken to experiment on a small piece first, as stain is absorbed readily and a dark shade quickly produced.
5. Fill with proprietary filler or mixture of whiting, spirit and linseed oil. Sand, prime and paint in the ordinary way. Alternatively, mix Alabastine to a smooth paste with the undercoat, sand and paint in the ordinary way.

5a. Apply undercoat. Do not use an excessive quantity of thinners, particularly when spraying. Lightly sand between coats to remove raised paper fibres. Finish paint in the ordinary way. No filler or priming coat is required.

6. Wet the board and apply plaster as usual. It is important to ensure that the structure to which the boards are secured is quite rigid.

HANDLING AND FABRICATING

In general all processes, both with hand and machine tools, which are applicable to timber are also applicable to Weyroc. It is, however, necessary to have an understanding of the way in which Weyroc differs from timber, for it to be used to its full advantage and in the greatest possible number of applications. These notes are intended to give guidance in this connection.

Storage and Transport. Weyroc should be stored flat and close piled on timber battens 2″ to 4″ from the ground in a dry store. Weyroc must not be stored in the open, and it is highly desirable to use a closed shed. The method used in the works of The Airscrew Co. & Jicwood Ltd., which has been developed from an extensive experience in handling this material, is clearly described in Fig. X.

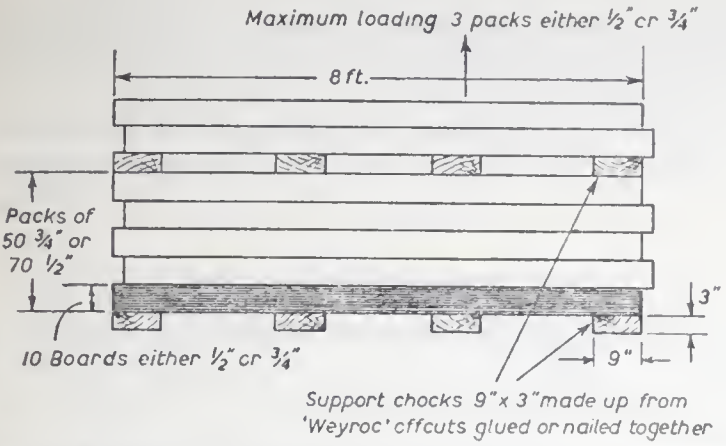
In handling care must be taken not to damage edges and corners.

Weyroc should be close piled on flat lorries and be well sheeted down to protect against rain.

In the Weyroc store, boards should be set aside for use as top cover boards. Due to the difference in conditions of the two sides of the top board of a pile, some bowing usually takes place, and by having a permanent cover board, the main stock of material will remain unaffected and wastage be eliminated.

Laying Off. When using Weyroc, one of the advantages is the small amount of waste. On account of the large board size and absence of direction of grain structure, geometry alone governs the laying out of parts for cutting, and careful study will usually result in an extremely small percentage of waste per board. It is well worth while to give more attention than usual to this matter, as considerable economies can thereby be effected.

FIG. X



Note: We normally use substandard ¾" boards at the bottom and top of each pack to prevent damage to board from fork lift trucks.

Working with Hand Tools

(*a*) **Sawing**—Treatment is exactly as for timber, and material should of course always be marked out on the face side. It should be noted that the chip size varies slightly on the two sides and except for load bearing applications when the small chip side should be uppermost, the desired size should be selected as the face. As with timber, some tearing occurs on the reverse side.

If it is essential that both edges are clean, it is necessary to clamp to a piece of waste and saw through both pieces. This method is sometimes worth applying when cutting Veneered or Paper Surfaced board.

When cutting veneered Weyroc, to ensure a clean appearance to the cut edge, a sharp knife cut should be made in the veneer along the cutting lines after marking out, and before sawing begins.

A useful tip when cutting several pieces of paper surfaced Weyroc ready for subsequent assembly, is to coat the edges with glue immediately after cutting. This strengthens the sharp edges of the paper, and prevents chipping, which can occur during careless handling.

(*b*) **Planing**—Edge planing presents no difficulties, but tools should be kept sharp for best results. Planing on the face is not practicable and is unnecessary.

(*c*) **Drilling**—Always drill on to a block to prevent tearing on the reverse side. This is particularly important when working with veneered and paper surfaced Weyroc.

(*d*) **Jointing**—All the normal timber joints can be readily made with the appropriate tools, and no special precautions are required.

(*e*) **Nailing**—Nails have good holding power in Weyroc, but should be thinner than for normal timber practice. Do not nail too near the edges.

(*f*) **Screwing**—All screw holes should be pre-drilled to the full depth of the screw, and clearance holes should be provided for the shank of the screw. Suitable drilling sizes are shown in Table 5.

(*g*) **Glueing**—For normal fabrication work all the usual timber glues can be used successfully. In all cases makers' instructions should be closely followed.

TABLE 5

Screw Gauges and Drill Sizes required

Gauge of Screw		000 0	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Clearance Hole	in.	1/16	5/64	5/64	3/32	7/64	1/8	1/8	5/32	5/32	3/16	3/16	7/32	7/32	1/4	1/4
Thread Hole	in.	1/32	3/64	3/64	1/16	1/16	5/64	5/64	5/64	3/32	3/32	1/8	1/8	1/8	1/8	5/32
Gauge of Screw		14	15	16	17	18	20	22	24	26	28	30	32	36	40	50
Clearance Hole	in.	1/4	9/32	9/32	5/16	5/16	11/32	3/8	7/16	7/16	1/2	1/2	9/16	5/8	11/16	13/16
Thread Hole	in.	5/32	5/32	3/16	3/16	3/16	7/32	7/32	1/4	1/4	9/32	9/32	5/16	11/32	3/8	7/16

WEYROC FLOORING

The good abrasion resistance properties and high dimensional stability and pleasing appearance of Weyroc boards led to the development of tiles and blocks, suitable for fixing to solid floors with mastic in the conventional way used with wood blocks.

Two grades are manufactured—Super Grade, of specially high density for heavy wear and where the highest possible degree of surface finish is required, and Grade I suitable for most normal domestic applications.

Super Grade is manufactured in 9″×9″ tiles and 9″×3″ blocks and rebated round the edges for seepage of mastic.

Grade I is manufactured in 9″×9″ tiles with an embossed back to provide a good key and also seepage space.

All the tiles are nominally $\frac{5}{8}$″ thick $\pm\frac{1}{64}$″ and are classified for thickness. Three classes, 1, 2 and 3 are used, and the tiles and bundles are marked with the class numbers and should not be mixed when laying any one floor.

The greatest possible precautions are taken to ensure rectangularity, and any faulty tiles will be replaced free of charge.

LAYING

(*a*) **The sub floor**

Weyroc Floors can be laid on any sub floor that is firm, dry and level. When laying new sub floors, a 3-1 sharp sand/cement screed should be wood floated or steel trowelled on the concrete, with a suitable moisture barrier between. Adequate time should be allowed for the screed to dry, usually not less than three weeks. The screed must be to the satisfaction of the floor layer.

(*b*) **Adhesives**

Prior to application all loose dust must be brushed off and oil or grease stains be removed.

(i) Hot Bitumen. Where applicable, hot mastics of the bituminous type give a satisfactory result at a low cost. Consideration must be given to special conditions, e.g. hot sunlight, etc., and the correct grade of mastic be chosen.

(ii) Bitumen Emulsions. These are mainly water emulsions, and to ensure satisfactory results, must be used correctly as otherwise bowing, lifting or other faults may develop.

(iii) Latex adhesives. Many varieties are marketed, and reputable manufacturers give full instructions, and guarantee their products.

(*c*) **Finishing** (See also Table 4, page 33).

After laying, the floors must be sanded off smooth and level with a mechanical sander.

It is imperative that Weyroc floors are sealed after sanding and a wide range of proprietary brands are available. Those using oleo resins are probably the most trouble-free to apply. A light hand sanding after sealing improves the ultimate finish, and it is recommended that the makers' instructions are followed to obtain the best satisfaction.

If dark floors are required, it is advisable to apply one coat of sealer, following with a spirit stain and then a further coat of sealer. A light sanding after the second sealer is advisable. Water stains are undesirable.

A good quality hard wax paste should be applied liberally on new floors. Maintenance is carried out by polishing in the usual way. Washing or scrubbing should be avoided. For local cleaning when necessary, white spirit can be used.

(*d*) **General**

Floor laying is specialists' work, and where possible a reputable floor layer should be employed. Most faults in wood block floors of any kind can be avoided if the work is carried out by experts in the first instance.

Before laying the floor, bundles should be opened and allowed to "age" in the conditions under which they will be used.

(*e*) **Panel Heating**

On account of its dimensional stability, Weyroc is a suitable material for laying over floor panel heating systems. Special attention must be paid to the choice of an adhesive to withstand the temperature of the floor which may be 80°F. or higher, and wherever possible the bundles of tiles should be opened and the tiles be allowed to lie in the normal room conditions for two or three days before laying. All other information relating to Weyroc flooring is applicable.

TABLE VI

PROPRIETARY PRODUCTS

Trade Name	Manufacturer	Application
	Stains	
"Colron"	Ronuk Ltd., Portslade, Sussex.	Spirit Stain
"Temprima"	C. G. Templer & Co. Ltd., 109, Bollo Bridge Road, Acton, London, W.3.	Surface Filler
"Brummer"	Brummer Ltd., Oyster Lane, Byfleet, Surrey.	Surface Filler
Plastic Wood	The Rawlplug Co. Ltd., Rawlplug House, Cromwell Rd., London, S.W.7.	Filler for holes
Alabastine	Alabastine Co. Ltd., Ashmore Street, London, S.W.8.	Surface filler
	Sealers and Sealer/Polishes	
Pheenopol G.314	Nu-Finishes Ltd., 466, London Rd., Croydon, Surrey.	Clear sealer and floor finish
"Enlose"	Enfield Chemicals Ltd., Park Works, Clayton-le-Moors, Lancs.	Cellulose sealer for concrete shuttering work
Belco 315/141	Imperial Chemical Industries Ltd., Gloucester House, 147, Park Lane, London, W.1.	Clear sealer and finish for boards
Bourne Seal G.131	Floor Treatments Ltd., Bourne Works, High Wycombe.	Sealer for floors
Bourne Plastic Polish	Floor Treatments Ltd., Bourne Works, High Wycombe.	Sealer and finish for floors
Glossex Cold Hardening Lacquer	Vulcan Products Ltd., 24, Ryder St., London, S.W.1.	Sealer and finish for floors

Polishes

"Eldorado"	Cork Insulation & Asbestos Co. Ltd., 14, West Smithfield, London, E.C.1.	Liquid floor cleaner and polish
"Furmoto"	Furmoto Chemical Co. Ltd., 103, Brixton Road, London, S.W.9.	Non-slip floor polish
"Traffic Wax"	S. C. Johnson & Son Ltd., West Drayton, Middlesex.	Wax polish for flooring

Floor Mastics

"Aquaseal"	Berry Wiggins & Co. Ltd., Field House, Breams Buildings, Fetter Lane, London, E.C.4.	Floor tile mastic
Flintkote Adhesives	Industrial Asphalts Co. Ltd., 139/143, Oxford Street, London, W.1.	Floor tile mastic
Colset No. 11	Bitumen Industries Ltd., Farnham Road Trading Estate, Slough, Bucks.	Floor tile mastic
Grip-a-Block	G. O. C. Paints Ltd., Midland Bank Chambers, High St., Slough.	Floor tile mastic
Jastic	James Jackson & Co. (London) Ltd., Major Works, Major Road, Jamaica Rd., London, S.E.16.	Floor tile mastic
Plasoleum	Prodorite Ltd. (Plasoleum Division), Eagle Works, Wednesbury, Staffs.	Floor tile mastic
Probit Rock Bitumen	E. J. Jobling-Purser & Co. Ltd., St. Nicholas Chambers, Newcastle-on-Tyne 1.	Floor tile mastic
Synthaprufe	National Coal Board, Cardiff Division, 113 Bute Street, Cardiff.	Floor tile mastic

Miscellaneous

"Seelastik"	Expandite Ltd., Chase Road, Willesden, London, N.W.10.	Flexible sealer for joints
Aluminium Bitumen Paint	Wailes Dove Bitumastic Ltd., Hebburn, Co. Durham.	Moisture barrier paint

This list has been compiled for information only, and all questions relating to these products should be referred to the respective manufacturers.

TABLE VII

½" WEYROC

No. of Boards	Sq. Ft.	Weight Tons	cwts.	qrs.	lbs.	Cu. Ft.	Standards
1	32			2	4	1⅓	·008
2	64		1	0	8	2⅔	·016
3	96		1	2	12	4	·024
4	128		2	0	16	5⅓	·032
5	160		2	2	20	6⅔	·040
6	192		3	0	24	8	·048
7	224		3	3	0	9⅓	·057
8	256		4	1	4	10⅔	·065
9	288		4	3	8	12	·073
10	320		5	1	12	13⅓	·081
20	640		10	2	24	26⅔	·162
30	960		16	0	8	40	·242
40	1,280	1	1	1	20	53⅓	·323
50	1,600	1	6	3	4	66⅔	·404
60	1,920	1	12	0	16	80	·485
70	2,240	1	17	2	0	93⅓	·566
80	2,560	2	2	3	12	106⅔	·647
90	2,880	2	8	0	24	120	·728
100	3,200	2	13	2	8	133⅓	·809
200	6,400	5	7	0	16	266⅔	1·616
300	9,600	8	0	2	24	400	2·425
400	12,800	10	14	1	4	533⅓	3·234
500	16,000	13	7	3	12	666⅔	4·042
600	19,200	16	1	1	20	800	4·851
700	22,400	18	15	0	0	933⅓	5·660
800	25,600	21	8	2	8	1066⅔	6·469
900	28,800	24	2	0	16	1200	7·278
1000	32,000	26	15	2	24	1333⅓	8·087

These weights are based on the average density of 45 lbs. per cu. ft.
To allow for density variation add 5% to weights when using these figures for vehicle loading

Table VIII

¾" WEYROC

No. of Boards	Sq. Ft.	Weight Tons cwts. qrs. lbs.	Cu. Ft.	Standards
1	32	3 6	2	·012
2	64	1 2 12	4	·024
3	96	2 1 18	6	·036
4	128	3 0 24	8	·048
5	160	4 0 2	10	·061
6	192	4 3 8	12	·073
7	224	5 2 14	14	·085
8	256	6 1 20	16	·097
9	288	7 0 26	18	·109
10	320	8 0 4	20	·121
20	640	16 0 8	40	·242
30	960	1 4 0 12	60	·364
40	1,280	1 12 0 16	80	·485
50	1,600	2 0 0 20	100	·607
60	1,920	2 8 0 24	120	·728
70	2,240	2 16 1 0	140	·849
80	2,560	3 4 1 4	160	·970
90	2,880	3 12 1 8	180	1·091
100	3,200	4 0 1 12	200	1·212
200	6,400	8 0 2 24	400	2·424
300	9,600	12 1 0 8	600	3·638
400	12,800	16 1 1 20	800	4·850
500	16,000	20 1 3 4	1000	6·070
600	19,200	24 2 0 16	1200	7·282
700	22,400	28 2 2 0	1400	8·494
800	25,600	32 2 3 12	1600	9·706
900	28,800	36 3 0 24	1800	10·918
1000	32,000	40 3 2 8	2000	12·130

These weights are based on the average density of 45 lbs. per cu. ft.
To allow for density variation add 5% to weights when using these figures for vehicle loading

TABLE IX

Floor Areas and No. of Bundles of Weyroc Tiles required

No. of Bundles	9" × 9" Grade 1					9" × 3" Super Grade					9" × 9" Super Grade				
	Floor Area sq. yds.	Total Weight Tons	cwts.	qrs.	lbs.	Floor Area sq. yds.	Total Weight Tons	cwts.	qrs.	lbs.	Floor Area sq. yds.	Total Weight Tons	cwts.	qrs.	lbs.
1	1½			1	1	1				24	1½			1	8
2	3			2	2	2			1	20	3			2	16
3	4½			3	3	3			2	16	4½			3	24
4	6		1	0	4	4			3	12	6		1	1	4
5	7½		1	1	5	5		1	0	8	7½		1	2	12
6	9		1	2	6	6		1	1	4	9		1	3	20
7	10½		1	3	7	7		1	2	0	10½		2	1	0
8	12		2	0	8	8		1	2	24	12		2	2	8
9	13½		2	1	9	9		1	3	20	13½		2	3	16
10	15		2	2	10	10		2	0	16	15		3	0	24
20	30		5	0	20	20		4	1	4	30		6	1	20
30	45		7	3	2	30		6	1	20	45		9	2	16
40	60		10	1	12	40		8	2	8	60		12	3	12
50	75		12	3	22	50		10	2	24	75		16	0	8
60	90		15	2	4	60		12	3	12	90		19	1	4
70	105		18	0	14	70		15	0	0	105	1	2	2	0
80	120	1	0	2	24	80		17	0	16	120	1	5	2	24
90	135	1	3	1	6	90		19	1	4	135	1	8	3	20
100	150	1	5	3	16	100	1	1	1	20	150	1	12	0	16

These weights are based on the average density of 45 lbs. per cu. ft.
To allow for density variation add 5% to weights when using these figures for vehicle loading

General Data

Weyroc (REGD)

MAN-MADE TIMBER

THE AIRSCREW COMPANY & JICWOOD LTD., WEYBRIDGE, SURREY